Notes on Some Interpretive Aspects of the Left-Branch Extraction in Japanese

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1 Introduction

This article deals with the left-branch extraction (LBE) construction in Japanese.* The construction involves the extraction of a DP from inside another one: The sentence in (1) derives by the LBE of DP2, which originates within DP1.

(1)[$_{DP2}$ Tanaka-sensei-no]$_i$, tabun kore-ga [$_{DP1}$ t_i saigo-no chosho-ni] naru
Tanaka-Prof.-Gen probably this-Nom last-Gen book-Dat become
daroo
seem
'It seems that this will probably become Prof. Tanaka's last book.'
(Yatabe (1996: 304))

Previous studies have found that it depends on the language whether it permits LBE or not; according to Ross (1967, 1986), it is available in Slavic languages and Latin while not in English, German, French, Danish, Italian, and Finnish. As for Japanese, Snyder, Wexler, and Das (1995), Nomura and Hirotsu (2005), and Kato (2007) argue against the availability of LBE in Japanese whereas Takahashi and Funakoshi (2013) and Shiobara (2016) acknowledge that there are acceptable and unacceptable instances of LBE in Japanese, and propose syntactic and phonological constraints on LBE, respectively. At the same time, it varies from speaker to speaker as to whether they judge LBE to be acceptable. Among the eleven speakers who I consulted, five out of them found the construction acceptable, and then gave me the Japanese LBE data in this paper. I will leave the explanation of inter-speaker variation as a future research topic.

This paper will focus on some interpretive properties of the LBE construction, namely, quantificational scopes and (the lack of) Condition C effects. As observed in section 2, LBE does not expand the scope of the fronted DP, and LBE helps circumvent Condition C violations. In other words, the fronted DPs reconstruct for scope but not for Condition C. In section 3, I will try to account for these facts about (anti-)reconstruction by the semantic approach to scope reconstruction (section 3.1). Then, I will deduce the obligatoriness of scope reconstruction from a variant of the theory of Scope Economy that is modified to regulate scope expansion of overt movement (section 3.2). Section 4 is a conclusion.

2 Data

2.1.Scope

In this section, we will observe that LBE never expands the scope of the moved element, i.e., LBE is bound to reconstruct for scope. The sentences in (2) involve multiple quantifiers. Let us see how LBE affects their relative scopes. The canonical word order (2a) only allows for the DP3>DP2 reading that is true when there is someone who respects everyone's father. When DP1 undergoes scrambling across DP3 as in (2b), the DP2 > DP3 reading becomes available which is true when for everyone y, there is someone who praises y's father. However, when DP2 alone is moved by LBE, as in (2c), the speakers who accepted LBE detected only the DP3>DP2 reading. The same holds for (3):

(2) a. [$_{DP3}$ dareka-ga] [$_{DP1}$[$_{DP2}$ subete-no gakusee-no] titioya-o] sonkeesiteru
someone-Nom all-Gen student-Gen father-Acc respect
'Someone respects everyone's father.' DP3>DP2; *DP2>DP3

b. [$_{DP1}$[$_{DP2}$ subete-no gakusee-no] titioya-o] [$_{DP3}$ dareka-ga] t_1 sonkeesiteru
DP3>DP2; DP2>DP3

c. [$_{DP2}$ subete-no gakusee-no] [$_{DP3}$ dareka-ga] [$_{DP1}$ t_2 titioya-o] sonkeesiteru
DP3>DP2; *DP2>DP3

(3) a. Taroo-ga [$_{DP3}$ dareka-ni] [$_{DP1}$[$_{DP2}$ sukunakutomo hutatu-no mondai-
Taro-Nom someone-Dat at.least two-Gen question-

no] kotae-o] osieta DP3>DP2; *DP2>DP3
Gen answer-Acc told
'Taro told someone the answers to at least two questions'

b. [$_{DP1}$[$_{DP2}$ sukunakutomo hutatu-no mondai-no] kotae-o] Taroo-ga [$_{DP3}$ dareka-ni] t_1 osieta DP3>DP2; DP2>DP3

c. [$_{DP2}$ sukunakutomo hutatu-no mondai-no] Taroo-ga [$_{DP3}$ dareka-ni] [$_{DP1}$ t_2 kotae-o] osieta DP3>DP2; *DP2>DP3

Thus, LBE turns out not to alter the relative scopes of fronted and crossed DPs.[1]

Now let us consider bound anaphora, which at least requires the binding antecedent to scope over the bound pronoun. (4a), in the canonical order, lacks the reading in which it is bound by DP2. The LBE of DP2 does not feed the bound reading, as in (4b). The reading becomes available when DP1 undergoes scrambling.

(4) a. [$_{DP3}$ soko-no$_{i/*j}$ syain-ga] [$_{DP1}$[$_{DP2}$ mittu-no kaisya-no]$_j$
there-Gen employee-Nom three-Gen companies-Gen
datuzee-o] kokuhatusita
tax.evasion-Acc accused
'Their employees blew the whistle on the tax evasion by three companies.'

b. [$_{DP2}$ mittu-no kaisya-no]$_j$ [$_{DP3}$ soko-no$_{i/*j}$ syain-ga] [$_{DP1}$ t_j datuzee-o] kokuhatusita

c. [$_{DP1}$[$_{DP2}$ mittu-no kaisya-no] datuzee-o]$_j$ [$_{DP3}$ soko-no$_{i/*j}$ syain-ga] t_j kokuhatusita

The fact that LBE does not feed scope inversion nor bound anaphora follows straightforwardly if we assume that LBE is always followed by scope reconstruction of the fronted DP.

2.2. Condition C

Movement is known to bleed Condition C under certain circumstances (the anti-reconstruction effect). (5a) exemplifies Condition C reconstruction; the pronoun *he* c-commands the trace of the moved *wh*-phrase containing the R-expression *John*, and *he* must refer to someone other than *John*. The status is accounted for given that Condition C must be observed through the derivation; before the *wh*-movement, there is a derivational stage where the pronoun c-commands the R-expression. As (5b) shows, if the pronoun does not c-command the trace, the coreference is possible.

(5) a. [Which argument that John$_j$ is a genius] did he$_{i/*j}$ believe t_1? (Fox (1999: 164))

b. [Which argument that John$_j$ is a genius] did his$_{i/j}$ colleague believe t?

On the other hand, in (6a), we observe an instance of Condition C *anti*-reconstruction; *he* and *John* can be coreferential even though *he* c-commands the trace of the *wh*-phrase.

(6) a. [Which argument that John$_j$ made] did he$_{i/j}$ believe t? (Fox (1999: 164))

b. [Which argument that John$_j$ made] did his$_{i/j}$ colleague believe t?

Lebeaux (1988) argues that the contrast between (5a) and (6a) reduces to the environment in which the antecedent R-expression occurs: In (5a), it is contained in the complement to the wh-phrase whereas in (6a), it is contained in the adjunct of the wh-phrase. Lebeaux accounts for the anti-reconstruction effect in (6a) in terms of the Late Merger of adjuncts, according to which, the adjunct can be merged with the wh-phrase after movement, so that the R-expression can escape being c-commanded by the subject pronoun at any stage of derivation.

Condition C (anti-)reconstruction can also be observed for LBE. The LBE construction (7b) is derived from the canonical order (7a), and the R-expression *Taroo* in DP2 is not contained in an adjunct. In both sentences, the subject pronouns cannot be coreferential with *Taroo*. (8) replaces the subject with the DP containing a pronoun, and allows coreference between *Taroo* and the pronoun

(7) a. kare$_{i/*j}$-ga [$_{DP1}$[$_{DP2}$ Taroo$_j$-no ronbun-no] mondai-ni] kiduita
he-nom Taro-Gen paper-Gen problem-Dat noticed
'He noticed the problem with Taro's paper.'

b. [$_{DP2}$ Taroo$_j$-no ronbun-no] kare$_{i/*j}$-ga [$_{DP1}$ t_1 mondai-ni] kidui-ta

(8) a. kare$_{i/j}$-no sensee-ga [$_{DP1}$[$_{DP2}$ Taroo$_j$-no ronbun-no] mondai-ni] kiduita
he-Gen teacher-Nom Taro-Gen paper-Gen problem-Dat noticed
'His teacher noticed the problem with Taro's paper.'

b. [$_{DP2}$ Taroo$_j$-no ronbun-no] kare$_{i/j}$-no sensee-ga [$_{DP1}$ t_1 mondai-ni] kidui-ta

When the R-expression is contained within an adjunct of DP2, LBE starts to bleed Condition C. Consider (9); the pronoun *kare* in (9a), c-commanding DP2, cannot refer to *Taroo* due to Condition C while in (9b), they can be coreferential as a result of the LBE of DP2. (10a, b) are controls.

(9) a. kare$_{i/*j}$-ga [$_{DP1}$[$_{DP2}$ Taroo$_j$-ga kaita ronbun-no] mondai-ni] kiduita
he-Nom Taro-Nom wrote paper-Gen problem-Dat noticed
'He$_{i/*j}$ noticed the problem with the paper that Taro$_j$ wrote.'

b. [$_{DP2}$ Taroo$_j$-ga kai-ta ronbun-no] kare$_{i/j}$-ga [$_{DP1}$ t_2 mondai-ni] kiduita

(10) a. kare$_{i/j}$-no sensee-ga [$_{DP1}$[$_{DP2}$ Taroo$_j$-ga kaita ronbun-no mondai-ni
he-Gen teacher-Nom Taro-Nom wrote paper-Gen problem-Dat
kiduita
noticed
'His$_i$ teacher noticed the problem with the paper that Taro$_i$ wrote.'

b. [$_{DP2}$ Taroo$_j$-ga kaita ronbun-no] kare$_{i/j}$-no sensee-ga [$_{DP1}$ t_2 mondai-ni]
kiduita

2.3.Scope and Condition C

Finally, let us combine the scope test and the Condition C test to see whether there is a correlation between scope reconstruction and Condition C reconstruction. In the sentences (11), DP3 and DP2 are quantificational, and the latter is modified by a relative clause containing an R-expression. In the canonical order (11a), the pronominal subject c-commands, and cannot be coreferential with, the R-expression, and the inverse scope DP2>DP3 is not available regardless of what the pronoun refers to. Crucially, in the LBE construction (11b), kare and *Taroo* can be coreferential; i.e., there was no Condition C reconstruction. Moreover, at the same time, the DP2>DP3 reading is unavailable. The sentences in (12) are controls, where the pronoun does not c-command DP1.

(11) a. kare$_{i/*j}$-ga [$_{DP3}$ aru gakusei-ni] [$_{DP1}$[$_{DP2}$ Taroo$_j$-ga kaita subete-no
he-Nom exist student-Dat Taro-Nom wrote all-Gen

ronbun-no] mondai-o] setumeisita
paper-Gen problem-Acc explained
'He explained to a student the problem with every paper that Taro wrote.'
DP3>DP2; *DP2>DP3

b. [$_{DP2}$ Taroo$_j$-ga kaita subete-no ronbun-no] kare$_{i/j}$-ga [$_{DP3}$ aru gakusei-ni] [$_{DP1}$ t$_2$ mondai-o] setumeisita. DP3>DP2; *DP2>DP3

(12) a. kare$_{i/j}$-no dooryoo-ga [$_{DP3}$ aru gakusei-ni] [$_{DP1}$[$_{DP2}$ Taroo$_j$-ga kaita
she-Nom colleague-Nom exist student-Dat Taro-Nom wrote
subete-no ronbun-no] mondai-o] setumeisita
all-Gen paper-Gen problem-Acc explained
'His colleague explained to a student the problem with every paper that Taro wrote.' DP3>DP2; *DP2>DP3

b. [$_{DP2}$ Taroo$_j$-ga kaita subete-no ronbun-no] kare$_{i/j}$-no dooryoo-ga [$_{DP3}$ hitori- no gakusei-ni] [$_{DP1}$ t_2 mondai-o] setumeisita.
DP3>DP2; *DP2>DP3

Let us summarize the observations in this section. In the LBE constructions, (i) the fronted quantificational DPs are subject to scope reconstruction, (ii) Condition C anti-reconstruction holds when an R-expression is contained in an adjunct of the fronted DPs, and (iii) scope reconstruction and Condition C anti-reconstruction are simultaneously observed.

3 Analysis

What we need to explain about the LBE construction is (i) why scope reconstruction is obligatory and (ii) why scope reconstruction is independent of condition C. In the discussion that follows, in section 3.1, we start with the second problem and argue that the semantic approach to reconstruction can account for the fact. Then in section 3.2, we turn to the first problem and propose that Scope Economy accounts for the obligatoriness of scope reconstruction in the LBE construction.

But before we do that, let me introduce some background assumptions about the semantic interpretation of syntactic structures. (Fragments of) syntactic representations are interpreted in the way developed in Heim and Kratzer (1998).

I assume the interpretation rules defined below, where, by $[\![\alpha]\!]^g$ is understood the interpretation of α under an assignment g:[2]

(13) Functional Application (FA)

If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment g, if $[\![\beta]\!]^g$ is a function whose domain contains $[\![\gamma]\!]^g$, then $[\![\alpha]\!]^g =_{FA} [\![\beta]\!]^g([\![\gamma]\!]^g)$.

(14) Predicate Modification (PM)

If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment g, if $[\![\beta]\!]^g$ and $[\![\gamma]\!]^g$ are both functions of type <e, t>, then $[\![\alpha]\!]^g =_{PM} \lambda x_{\in De}. [\![\beta]\!]^g(x) = [\![\gamma]\!]^g(x) = 1$.

(15) Predicate Abstraction Rule (PA)

If α is a branching node with daughters β and γ, where β (apart from vacuous material) dominates only an index $<i, \tau>$, then, for any assignment g, $[\![\alpha]\!]^g =_{PA} \lambda x_{\in D\tau}. [\![\gamma]\!]^{g[<i, \tau> \rightarrow x]}$

(16) Traces and Pronouns Rule (TP)

If α is a trace or a pronoun, and i and τ are a number and a type respectively, then, for any assignment g, $[\![\alpha_{<i, \tau>}]\!]^g =_{TP} g(i, \tau)$.

Additionally, I adopt the interpretation rule of argument saturation in (17) (Büring (2004)):[3]

(17) Argument Saturation (AS)

If α is a branching node and $\{\beta, \gamma\}$ the set of its daughters, then, for any assignment g, if $[\![\beta]\!]^g \in D_{<et, t>}$ and $[\![\gamma]\!]^g \in D_{<e, Tt>}$, then $[\![\alpha]\!]^g{}_{\in D_{<T, t>}} =_{AST} \lambda \phi [\![\beta]\!]^g(\lambda x.[\![\gamma]\!]^g(x)(\phi))$, where T is a variable over types.

Furthermore, movement leaves behind a trace co-indexed with its antecedent, as shown in (18a). An index is the pair $<i, \tau>$ of an integer i and a semantic type τ. (18a) will subsequently be modified into (18b), which is required for interpreting movement dependencies in terms of PA.

(18) a. $[_\alpha \text{ XP}_{<i, \tau>} [_\beta \ldots t_{<i, \tau>} \ldots]]$

b. $[_\alpha \text{ XP} [_\gamma <i, \tau> [_\beta \ldots t_{<i, \tau>} \ldots]]]$

3.1.Scope Reconstruction and Condition C Anti-Reconstruction

As for the implementation of scope reconstruction, there are two approaches:

the semantic reconstruction (SemR) analysis (Cresti (1995), Rullmann (1995)) and the syntactic reconstruction (SynR) analysis (May (1985), Cinque (1990), Chomsky (1993), among others). I will argue that the former of these is consistent with the independence of scope and condition C observed in section 2. Let me first introduce SemR and then SynR.

The SemR analysis achieves scope diminishment by postulating different semantic types for traces: individual type e and generalized-quantifier type <et, t>. Take (19) for example, which is scopally ambiguous:

(19) Someone is likely $[_{TP}$ *t* to $[_{v^*P}$ win the race]]

someone>likely, likely>someone

When the moving category leaves a trace of type e, it takes scope at the landing site. In (20), the trace is typed e, and hence PA interprets β as a function in $D_{<e, t>}$. The subject, denoting in $D_{<et, t>}$, takes β as an argument. α is interpreted by FA, *with someone* the function and β the argument. As a result, the subject ends up taking scope over the intensional predicate *likely*.[4]

(20) $[_{\alpha}$ someone $[_{\beta\ <1, e>}$ $[_{\gamma}$ is likely $t_{<1, e>}$ to win the race]]

$[\![\alpha]\!]^{g} \in D_t$ = someone′(λ x.likely′(win-the-race′(x)))

Now suppose *someone* leaves a trace of type <et, t>, as in (21). Then PA interprets β as a function in D<et, t>. This time, FA interprets β as the function and *someone* as the argument. Accordingly, the subject is interpreted in the scope of *likely*.

(21) $[_{\alpha}$ someone $[_{\beta\ <1, ett>}$ $[_{\gamma}$ is likely $t_{<1, ett>}$ to win the race]]

$[\![\alpha]\!]^{g} \in D_t$ =likely′(someone′(λ y.win-the-race′(y)))

On the other hand, based on the perspective that the scope of a category is syntactically represented in terms of c-command. SynR covertly lowers *someone* so that it ends up occupying the launching site in the input representation to interpretation. For example, (19) is mapped to (22) by the SynR of the subject to the trace t, where XPhon stands for the phonological features of X and makes no contribution to semantic interpretation, and X_{Sem} is the semantic features of X relevant to semantic calculation:

(22) Someone_{Phon} is likely [TP someone_{Sem} <1, e> $[_{v^*P}$ to win the race]]

The embedded TP denotes the proposition *someone′(λ x.win-the-race′(x))*, to which *likely* applies to yield the reconstructed reading *likely>someone*.

Importantly, SynR and SemR differ in the structure they submit to interpretation; SemR keeps the moved XP intact at the landing site, as in (23b) whereas SynR makes it occupy the launching site syntactically, as in (23a):

(23) a. $XP_1 [\ldots t_1 \ldots] \rightarrow_{\mathrm{SemR}}$ $XP <1, ett> [\ldots t_{<1,\,ett>} \ldots]$

b. $XP_1 [\ldots t_1 \ldots] \rightarrow_{\mathrm{SynR}}$ $\mathbb{XP}_{\mathrm{Phon}} [\ldots XP_{\mathrm{Sem}} \ldots]$

In the previous literature, this contrast has been taken to make different predictions regarding Condition C for the configuration (24), where *R* and *P* are an R-expression and a pronoun, respectively, the adjunct containing R has been Late-Merged into DP1 (Lebeaux (1988)), and P c-commands the trace t_1 of DP1 (Lechner (1998, 2013), Romero (1998), Sharvit (1998), Fox (1999, 2000) among others).

(24) $[_{\mathrm{DP1}} [_{\mathrm{Adjunct}} \ldots R \ldots]]1 \ldots P \ldots t_1 \ldots$

SynR and SemR map (24) to (25) and (26), respectively:

(25) $\mathbb{DP1Phon} \ldots P \ldots [_{\mathrm{DP1}} [_{\mathrm{Adjunct}} \ldots R \ldots]]_{\mathrm{Sem}} \ldots$

(26) $[_{\mathrm{DP1}} [_{\mathrm{Adjunct}} \ldots R \ldots]]_{<1,\,ett>} \ldots P \ldots t_{<1,\,ett>} \ldots$

On the one hand, the SynR analysis leads to the prediction that scope reconstruction will induce the Condition C reconstruction effect since P ends up c-commanding R in (25). On the other hand, the SemR analysis predicts that DP1 can scopally reconstruct without feeding the Condition C violation since P fails to c-command R in (26).

Now remember from section 2.3 that the scope reconstruction in the LBE construction does not induce Condition C effect when the R-expression is contained in an adjunct. (11b) is repeated in (27).

(27) [$_{\mathrm{DP2}}$ Taroo$_j$-ga kaita subete-no ronbun-no] kare$_{i/j}$-ga [$_{\mathrm{DP3}}$ aru gakusee-ni
Taro-Nom wrote all-Gen paper-Gen he-Nom exist student-Dat
[$_{\mathrm{DP1}}$ t_2 mondai-o] setumeisita.
problem-Acc explained DP3>DP2; *DP2>DP3
'He explained to a student the problem with every paper that Taro wrote.'

This suggests that the scope reconstruction involved in the LBE construction should be able to take the form of the SemR, which will represent the sentence (27) as in (28):

(28) [$_{\text{DP2}}$ every paper that Taro wrote]$_{<5,\ ett>}$ he$_{<4,\ e>}$ [$_{\text{DP3}}$ a student]$_{<3,\ e>}$ [$t_{<5,\ ett>}$ the problem]$_{<1,\ e>}$ [$_{\text{v*P}}$ $t_{<4,\ e>}$ explained $t_{<1,e>}$ to $t_{<3,\ e>}$]

Here DP2 leaves the GQ-type trace $t_{<5,\ ett>}$ in the scope of DP3. Therefore, by SemR, DP3>DP2 will obtain. Notice that in this structure, the subject pronoun does not c-command the R-expression *Taro*, and hence Condition C does not exclude their coreference.[5]

3.2.Deriving Obligatory Scope Reconstruction

In this section, we move on to the analysis of the obligatoriness of scope reconstruction in the LBE construction. First, I assume that Chomsky's (2000) Phase Impenetrability Condition (PIC), as formulated in (29), imposes a locality condition on movement, and that CP, v*P, and DP are phases.[6,7]

(29) Phase Impenetrability Condition

In phase α with head H, the domain of H is not accessible to operations outside α, only H and its edge are accessible to such operations.

(Chomsky (2000: 108))

Thus, the extraction of DP2 from DP1, for example, always takes the form indicated in (30a), where XP first lands at the edge of DP. The PIC bars the movement from skipping that position as in (30b):

(30) a. DP2 ⋯ [$_{\text{DP1}}$ t [D1 … t …]]

b. * DP2 ⋯ [$_{\text{DP1}}$ [D1 … t …]]

Second, I assume that whenever movement applies, a decision will be made about what semantic type of trace to leave; as we saw in section 3.1, a trace of type e expands the scope of the moving element whereas a trace of type <et, t> leads to scope reconstruction. This decision, I argue, is constrained by a variant of Scope Economy and Shortest Move Principle (Fox (2000: 21-23)), where, by OP is understood a scope shifting operation:

(31) Scope Economy (to be revised)

OP can apply only if it affects semantic interpretation. (i.e., only if inverse scope and surface scope are semantically distinct.)

(32) Shortest Move

QR must move a QP to the closest position in which it is interpretable.

Scope Economy regulates optional instances of movement, but not obligatory ones: Fox assumes that the former includes quantifier raising (QR) from an interpretable position and the latter includes QR of, e.g., complements, without which V and QP would cause a type mismatch.[8] To the list of the former, I propose to add overt optional movement like scrambling, which I assume LBE is an instance of.

The idea of explaining the scopal characteristics of scrambling from the perspective of Scope Economy can also be found in Miyagawa (2006). He suggests that the Scope Economy governs whether DPs can expand their scope through scrambling. Informally speaking, (33) allows for the object wide scope because its scrambling across the subject conforms to Shortest Move and it yields a distinct interpretation, as Scope Economy requires. On the other hand, for (34), the scrambling from t_i to t_i' crosses no scope bearing element, which violates Scope Economy.

(33) Daremo-o$_i$ dareka-ga t_i aisiteiru
everyone-Acc someone-Nom love
'Someone loves everyone' $\forall > \exists$, $\exists > \forall$

(34) Daremo-o$_i$ dareka-ga [$_{CP}$ t_i' Taroo-ga t_i aisiteiru to] itta (koto)
everyone-Acc someone-Nom Taro-Nom love C said fact
'Someone said that Taroo loves everyone.' $* \forall > \exists$, $\exists > \forall$

However, as Miyagawa does not provide a formalization of that idea, I propose one version of Scope Economy Principle generalized to cover optional instances of covert as well as overt movement.

(35) Scope Economy
Movement of a QP, overt or covert, can leave a trace of type e only if it affects semantic interpretation; otherwise, it must leave a trace of type <et, t>

Note that while Fox's formulation of Scope Economy constrains the application of QR, subjecting overt movement to Scope Economy should not mean imposing restrictions on the *application* of the movement itself; for that would incorrectly prohibit non-quantificational DPs, say *John*, from being scrambled at all. Rather, by Scope Economy for overt movement, I mean imposing restrictions on the *interpretation* of the movement dependency. In (35), this idea is materialized by making Scope Economy be silent on the application of movement *per se* and restrict the designation of the semantic type of traces, which bears on interpretation.

The intuition behind the revised Scope Economy is that, in principle, the members of a movement chain should be identical in their semantic type. Scrambling dependencies can span as long a distance as you like (except for extraction from syntactic islands). For QP movements that do not affect semantic interpretation and therefore violate Scope Economy, such as the first step of long-distance scrambling in (34), the scrambling itself is allowed, but it must make the trace of the QP of type <et, t>, not e, and thus be subject to SemR. Scrambling of a non-quantificational DP, denoting in D_e, can leave an e-type trace because that type is shared by the antecedent.

Imposing the same Scope Economy constraint on covert movement and overt movement would have caused a kind of conceptual unnaturalness in a framework such as Extended Standard Theory, which postulates separately the overt syntactic component from D-structure to S-structure and the covert syntactic component from S-structure to LF; why should Scope Economy, which is an interpretive constraint, refer to operations applied before S-structure? However, in the framework of phase theory, which assumes multiple spell-outs, the difference between overt movement and covert movement is simply reduced to the difference between pronouncing the head and the tail of the movement chain. Pronunciation being a matter of interfacing syntax and sensorimotor system, overt and covert movements are indistinguishable from each other as far as semantic interpretation is concerned. Therefore, it is natural that Scope Economy should be able to constrain (the interpretation of) both types of movement.

With this much in mind, let us move on to the analysis of the obligatoriness of scope reconstruction in the LBE construction taking (2c), repeated in (36), for example:

(36) [$_{DP2}$ subete-no gakusee-no][$_{DP3}$ dareka-ga] [$_{DP1}$ t_2 titioya-o] sonkeesiteru
all-Gen student-Gen someone-Nom father-Acc respect
'Someone respects every student's father.' DP3>DP2; *DP2>DP3

To derive (36), we start with the internal syntax of DP1. DP1 is assumed to be headed by a null D_{the} which makes the Russellian definite description:

(37) $[\![D_{the}]\!]^g = \lambda P \lambda R.\ \exists x[P(x)\ \&\ \forall y[P(y) \rightarrow x=y]\ \&\ R(x)] = \text{THE}'$

DP2 *subete-no gakusee* 'every student' is base-generated within NP as in (38).

(38) $[_{DP1}\ D_{the}\ [_{NP}\ DP2\ N_{father}]]$

DP2 moves to the edge of DP1, resulting in the structure as in (39):[9]

(39) $[_{DP1}\ DP2\ [_{\gamma\ <4,\ \tau>}\ [_{D'}\ D_{the}\ [_{NP}\ t_{<4,\ \tau>}\ N_{father}]]]]$

The semantic type τ on the movement index is regulated by Scope Economy. $\tau = e$ is permitted if that typing makes the DP1 in (38) and the one in (39) interpretively distinct; otherwise, $\tau = <et,\ t>$ is forced and DP2 fails to expand its scope due to SemR. So let us compare the denotations of the DP1 in (38) and (39). The former is given in (40), and the latter in (41):

(40) $[\![DP1_{(38)}]\!]^g \in D_{<et,\ t>} = \lambda R.\text{THE}'(\lambda x.\text{every}'(\text{student}')(\lambda y.\text{x-is-y's-father}'))$

(41) $[\![DP1_{(39)}]\!]^g \in D_{<et,\ t>} = \lambda R.\text{every}'(\text{student}')(\lambda z.\text{THE}'(\lambda x.\text{x-is-z's-father}')(R))$

Since the DP2 movement crosses a scope bearing element, i.e. D_{the}, $[\![DP1_{(39)}]\!]^g$ is interpretively distinct from $[\![DP1_{(38)}]\!]^g$. Therefore, Scope Economy licenses the typing of $\tau = e$. This completes the DP1-internal syntax.

Let us see what happens next with derivation. The DP1 is subsequently merged as the object of the verb as in (42), with the DP3 dareka-ga 'someone' being the subject.

(42) $[_{v^*P}\ DP3\ [_{VP}\ \text{respect}\ [_{DP1}\ DP2_{\ <4,\ e>}\ D']]]$

Then, DP1 moves to the outer edge of v*P to avoid a type mismatch, yielding (43) with the interpretation in (44):[10]

(43) $[_{v^*P'}\ [_{DP1}\ DP2_{\ <4,\ e>}\ D'][_{\gamma\ <5,\ e>}\ [_{v^*P}\ DP3\ [_{VP}\ \text{respect}\ t_{<5,\ e>}\ ]]]]$

(44) $[\![v^*P']\!]^g \in D_t = \text{every}'(\text{student}')(\lambda z.\text{THE}'(\lambda x.\text{x-is-z's-father}')(\lambda x.\text{some}'(\text{one}')(\lambda y.\text{y-respect-x}')))$

In accordance with Shortest Move, DP2 undergoes LBE, creating v*P″.

(45) $[_{v^*P''}DP2\ [_{\delta\ <8,\ \tau>}\ [_{v^*P'}\ [_{DP1}\ t_{<8,\ \tau><4,\ e>}\ D'][_{\gamma\ <5,\ e>}\ [_{v^*P}\ DP3\ [_{VP}\ \text{respect}\ t_{<5,\ e>}\ ]]]]]]$

Due to Scope Economy, for DP2 to expand the scope, it must be shown that (45) with $\tau = e$ is interpretively distinct from (44). The interpretation of (45) with $\tau = e$ is given in (46):

(46) $[\![\text{v*P}'']\!]^{g} \in D_t$ = every′(student′)(λ z.THE′(λ x.x-is-z′s-father′)(λ x.some′(one′)(λ y.y-respects-x)))

Note that the last line of (44) turns out to coincide with that of (46). This means that this instance of movement does not give rise to a new interpretation, and hence Scope Economy forces the typing of τ = <et, t>. As a result, (45) ends up in (47). There, the semantic type τ on the movement index <4, τ> is set to <et, t>, which signals SemR.

(47) $[_{\text{v*P}''}$ DP2 $[_{\delta}$ $_{<8,\ \underline{ett}>}$ $[_{\text{v*P}'}$ $[_{\text{DP1}}$ $t_{<8,\ \underline{ett}>}$ $_{<4,\ e>}$D′$]$$[_{\gamma}$ $_{<5,\ e>}$ $[_{\text{v*P}}$ DP3 $[_{\text{VP}}$ ...$]]]]]]$

So then, we will complete the rest of the derivation. The subject DP3 moves to the Spec, TP to satisfy EPP. Then, DP2 moves across the subject to derive the LBE word order, yielding (48).

(48) $[_{\text{TP}'}$ DP2 $[_{\phi}$ $_{<6,\ \tau>}$ $[_{\text{TP}}$ DP3 $[_{\sigma}$ $_{<7,e>}$ $[_{\text{v*P}''}$ $t_{<6,\ \tau>}$ $[_{\delta}$ $_{<8,\ ett>}$ $[_{\text{v*P}'}$ $[_{\text{DP1}}$ $t_{<8,\ ett>}$ $_{<4,\ e>}$D′$]$ $[_{\gamma}$ $_{<5,\ e>}$ $[_{\text{v*P}}$ $t_{<7,\ e>}$ $[_{\text{VP}}$ respect $t_{<5,\ e>}$ $]]]]]]]]]$

We now consider the semantic type τ of the index <6, τ> of the DP2 movement. So far in the derivation, when a movement occurred, there was an option to set the semantic type on the index to e or <et, t>, but for this movement of DP2, there is only the <et, t> option left. To see what makes the e-type option unavailable, consider the semantic type of the δ node, which is the sister of the trace $t_{<6,\ \tau>}$ of DP2. δ dominates the index <8, ett> and v*P′, and hence PA interprets δ as a function from $D_{<et,\ t>}$ to Dt. If $t_{<6,\ \tau>}$ were typed as <6, e>, it would fail to be in the domain of the function denoted by δ, and FA would fail to interpret their mother node v*P″. Even AS is not defined to be able to interpret such a configuration. For δ to compose with an expression of the right type, its sister, $t_{<6,\ \tau>}$ need to be of type <et, t>, in which case, FA can apply. Accordingly, the structure of the LBE construction (36), repeated in (49) is represented as in (50), with the denotation in (51):

(49) $[_{\text{DP2}}$ subete-no gakusee-no$]$$[_{\text{DP3}}$ dareka-ga$]$ $[_{\text{DP1}}$ t_2 titioya-o$]$ sonkeesiteru
all-Gen student-Gen someone-Nom father-Acc respect
'Someone respects every student's father.' DP3>DP2; *DP2>DP3

(50) $[_{\text{TP}'}$ DP2 $[_{\phi}$ $_{<6,\ \underline{ett}>}$ $[_{\text{TP}}$ DP3 $[_{\sigma}$ $_{<7,e>}$ $[_{\text{v*P}''}$ $t_{<6,\ \underline{ett}>}$ $[_{\delta}$ $_{<8,\ ett>}$ $[_{\text{v*P}'}$ $[_{\text{DP1}}$ $t_{<8,\ ett>}$ $_{<4,\ e>}$ D′$]$ $[_{\gamma}$ $_{<5,\ e>}$ $[_{\text{v*P}}$ $t_{<7,\ e>}$ $[_{\text{VP}}$ respect $t_{<5,\ e>}$ $]]]]]]]]]$

(51) $[\![\mathrm{TP}']\!]^{g}{}_{\in D_t}$= some′(one′)(λ y.every′(student′)(λ z.THE′(λ x.x-is-z' s-father′) (λ x.y-respect-x′)))

In the calculation of the denotation of TP′, FA interprets ϕ as a function and DP2 as its input, and the scope of DP2 is reconstructed semantically to the position occupied by the variable p inside ϕ. Thus, the last line of (51) says (49) is true iff there is someone who respects everyone' s father, which corresponds to the DP3>DP2 reading observed for the sentence.

Now we have accounted for why LBE fails to expand the scope. To summarize, the extraction of DP2 from DP1 must first target the edge of DP1 due to the PIC. Further movement of DP2 from the edge of DP1 to a clausal node was shown not to affect semantic interpretation, as a result of which, Scope Economy forces that movement to leave a trace of type <et, t> on the edge of DP1. Once a <et, t>-trace is created, DP2 is destined to semantically reconstruct for scope on that edge no matter how far it moves.

4.Conclusion

In this paper, I have demonstrated that LBE in Japanese undergoes obligatory scope reconstruction that does not induce Condition C reconstruction. I have deduced this behavior of LBE from the interaction of Scope Economy and the phase theory under the assumption that scope reconstruction should be implemented in terms of SemR.

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Notes

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[1] The sentence (i) allows for the fronted DP to scope over the crossed DP.

(i) [$_{\text{DP2}}$ dareka-no]$_i$ daremo-ga [$_{\text{DP1}}$ t_i titioya-o] sonkeesiteru $\forall > \exists$; $\exists > \forall$
someone-Gen everyone-Nom father-Acc respect
'Everyone respects someone's father.'

However, notice that this reading is already available for the sentence (ii), from which (i) derives by LBE:

(ii) daremo-ga dareka-no titioya-o sonkeesiteru $\forall > \exists$; $\exists > \forall$

In general, the existential scope of indefinites is upward unbounded (Fodor and Sag (1982)). Whatever explains this property, such as the existential closure of choice function variables (Reinhart (1998)), is sufficient to account for this interpretation of (i) and (ii). Thus, we do not have to assume for (i) that LBE expands the scope of DP2 beyond that of the subject.

[2] The definitions of FA and PM is borrowed from Heim and Kratzer (1998: 95), and those of PA and TP from Heim and Kratzer (1998: 213).

[3] Büring (2004) introduces AS to give appropriate semantics to the English inverse linking constructions, exemplified in (i):

(i) [$_S$ [$_{DP}$ Somebody from every city] hates its climate] every>some, #some>every

(i) allows for a reading where the embedded DP *every city* outscopes the embedding DP *somebody*. He assumes the DP-adjunction analysis of inverse linking (Larson (1985), May (1985), Rooth (1985), among others), in which the QR of the embedded DP targets the embedding one. The DP′ in (ii) meets the structural description for AS^{et}.

(ii) [$_S$ [$_{DP'}$ every city $_{<3, e>}$ [$_{DP}$ somebody from $t_{<3, e>}$]] hates its climate]

This analysis is in opposition to the S-adjunction analysis (May (1977), Hornstein (1995), among others), in which the QR targets a sentential node S. The S-adjunction analysis would not need AS because the node immediately dominating the embedded DP and its landing site S could be interpreted by FA, but it has been criticized for excluding attested interpretations (Heim and Kratzer (1998)) and allowing interpretations that do not exist (Larson (1985)).

[4] Hereafter, for reasons of space, the detailed semantic calculation procedures are omitted in this paper.

[5] The discussion does not entail that language does not have access to the strategy of SynR at all, but that SemR is *at least* required for scope reconstruction not to feed Condition C violation. Lechner (1998) proposes that languages employ both SynR and SemR strategies, arguing that the former is relevant to scope reconstruction feeding binding reconstruction.

[6] See Cecchetto (2004) for an early attempt to impose a version of the PIC on QR.

[7] See Citko (2014) for an extensive survey of phasehood of those categories.

[8] Fox does not assume the interpretation rule of AS^T, which, when T = e, would allow us to interpret the QPs in the complement to V in situ. I will maintain Fox's assumption of obligatory QR by postulating that AS is a last resort that can only be applied if the type mismatch cannot be resolved by movement. See also fn.10

[9] Note that the structure of the DP1 in (39) is almost isomorphic to the DP-adjunction structure in (ii) of fn.3, except for the pronunciation of the movement chain; the former spells out the head and the latter the tail of the chain.

[10] The reader might suspect that AS^{T} introduced in (6) provides a way, other than movement, to resolve the type mismatch in the VP node. Interpreting the VP node by AS^{e}, the denotation of the v*P of (42) will be as follows:

(i) $[\![\text{v*P}]\!]^{g} \in D_t = [\![\text{DP3}]\!]^{g}(\lambda \psi.[\![[_{\text{DP1}}\ \text{DP2 D}']]\!]^{g}(\lambda \text{x}.\psi\text{-respects-x}'))$

Stranding the DP1 in situ, LBE may map (42) to (ii), which is interpreted as (iii) with τ = e:

(ii) $[_{\text{v*P}'}\ \text{DP2}\ [_{\gamma\ <5,\ \tau>}\ [_{\text{v*P}}\ \text{DP3}\ [_{\text{VP}}\ \text{respect}\ [_{\text{DP1}}\ t_{<5,\ \tau>}\ \text{D}']]]]]$

(iii) $[\![\text{v*P}']\!]^{g} \in D_t = [\![\text{DP2}]\!]^{g}(\lambda \text{y}.[\![\text{DP3}]\!]^{g}(\lambda \psi.[\![[_{\text{DP1}}\ t_{<5,\text{e}>}\ \text{D}']]\!]^{g[<5,e>\to y]}(\lambda \text{x}.\psi\text{-respects-x}')))$

Since the interpretations (i) and (iii) are distinct, Scope Economy should allow τ to be e in (ii). However, it would mean that the LBE of DP2 should be able to expand its scope across the subject, contrary to fact. Preventing this undesirable consequence is another motivation for assuming that AS is a last resort that can only be applied if the type mismatch cannot be resolved by movement, as stated in fn.8. Now, let us make sure that this last resort requirement is indeed met by the two configurations that are assumed to be interpreted by AS: $[_{\text{NP}}\ \text{DP2 N}_{\text{father}}]$ in (38) and $[_{\text{DP1}}\ \text{DP2}\ _{<4,\ \text{e}>}\ \text{D}']$ in (39). As for the former, where DP2 is in the complement to N and hence it does not meet the structural description for FA, type-driven QR does not find a suitable landing site within NP, since there is no node of type t in it. Thus, for DP2 to be interpreted in the restrictor of DP1, we cannot appeal to movement, which justifies the application of AS. Turning to the latter, at the stage when DP1 should be interpreted for Scope Economy (i.e., immediately after the movement of DP2 to the edge of DP1 and before the merger of DP1 and V), DP1 is the root node. Therefore, we cannot trivially appeal to movement since there is no higher position that DP2 could move to at this point.

[11] If you could keep DP2 in situ within the NP complement to D_{the} until DP1 has adjoined to v*P and then move it directly to v*P′ skipping the edge of DP1, as in (i), the interpretations before and after that movement would be distinct. However, notice that such a derivation violates the PIC and hence cannot be derived in the first place.

(i) $[_{\text{v*P}''}\ \text{DP2}\ [_{\delta\ <4,\ \tau>}\ [_{\text{v*P}'}\ [_{\text{DP1}}\ \_\ \text{D}\ [_{\text{NP}}\ \text{father-of}\ t_{<4,\ \tau>}]][_{\gamma\ <5,\text{e}>}\ [_{\text{v*P}}\ \ldots]]]]]$

$\times$

Notes on Some Interpretive Aspects of the Left-Branch Extraction in Japanese

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This article deals with the left-branch extraction (LBE) construction in Japanese, focusing on some interpretive properties of the construction, namely, quantificational scopes and (the lack of) Condition C effects. It will be observed that LBE does not expand the scope of the fronted DP, and LBE helps circumvent Condition C violations; the fronted DPs reconstruct for scope but not for Condition C. The fact that scope reconstruction does not induce Condition C is argued to be compatible with the semantic approach to scope reconstruction, which achieves scope diminishment not by syntactic lowering of moved elements but by letting their traces be of quantifier type <et, t>. The obligatoriness of scope reconstruction is accounted for in terms of a variant of the theory of Scope Economy that is modified to regulate covert movement as well as scope expansion of overt movement.